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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/977,396

10/16/2001

Hans Mickelsson

040001-048

3035

37825

7590

05/31/2006

ERICSSON INC.  
6300 LEGACY DRIVE  
M/S EVR C11  
PLANO, TX 75024

EXAMINER

TRAN, DZUNG D

ART UNIT

PAPER NUMBER

2613

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/977,396

Applicant(s)

MICKELSSON ET AL.

Examiner

Dzung D. Tran

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 March 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-7,9-19 and 21-30 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1,3-7,9-19 and 21-30 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

***Specification***

***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “a first wavelength multiplexer comprising:

a radio access unit for transmitting and receiving radio unit user communications with the at least one radio unit; and

a fixed access unit for transmitting and receiving fixed access communications with fixed access subscriber; and

a multiplexer unit for multiplexing the radio communications and the fixed access communications onto fiber; and

a second wavelength multiplexer that receives the multiplexed communications on fiber communication link from the first multiplexer” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

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consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4-7, 10-19 and 22-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graves et al. US publication no. 2002/0191250 in view of Deng et al. US publication no. 2002/0196491.

Regarding claim 13, as far as examiner understood, Graves discloses in figure 3, a system for integrating a fiber optic fixed access network and a fiber optic radio access network, comprising:

a second edge photonic switch 14b (same as a first wavelength multiplexer)

comprising:

a radio access unit 10 for transmitting and receiving radio unit user

communications with the at least one radio unit 8; and

a fixed access unit 4c for transmitting and receiving fixed access communications with fixed access subscriber (page 8, paragraph 0096, line 4); and

a multiplexer unit 12c, 12d (same as claimed multiplexer unit) for multiplexing the radio communications and the fixed access communications onto fiber 13c, 13d; and

a first edge photonic switch 14a (same as a second wavelength multiplexer) that receives the multiplexed communications on fiber communication link 17a from the first multiplexer (e.g., a first edge photonic switch 14b) de-multiplexes the multiplexed communications on fiber communication link 17a and transmits the fixed access user communications to the fixed access network (4a, 4b) and transmits the radio unit user communications to radio network component (e.g., since the first and second edge photonic switch 14a, 14b perform the same function, it is inherently that the edge photonic switch 14a (same as a second wavelength multiplexer) also transmits the radio user communication to a radio network component the remotely located main unit of the radio base station). Graves further discloses at least one main unit (e.g. core node 16), connected to the first edge photonic switch 14a (same as claimed a second multiplexer), for transmitting and receiving the communications with the first edge photonic switch 14a.

Grave differs from claim 13 of the present invention in that Grave does not specifically disclose the first and second edge photonic switch 14a, 14b are the passive wavelength multiplexer and wherein a radio base station is divided into a main unit and a digital intermediate frequency processing unit, and the radio access unit comprising

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only radio related components of the base station, the main unit being located remotely from the radio access unit.

Deng discloses a passive wavelength router (e.g., passive multiplexer/demultiplexer) employing fiber mux/demux construction for mux/demux CWDM signal (page 2, paragraph 0015). At the time of the invention was made, it would have been obvious to a person of ordinary skill in the art to replace the edge photonic switches of Grave with the passive wavelength router taught by Deng.

One of ordinary skill in the art would have been motivated to do this in order to reduce cost, and avoid transmission penalties (e.g., crosstalk), see page 2, paragraph 0016 of Deng.

Furthermore, the specification page 15 discloses that the multiplexers can be passive multiplexer or passive multiplexer and specification, prior art figure 1, pages 2 and 3, paragraph 0004 discloses a radio base station is divided into a main unit 150 and a digital intermediate frequency processing unit 110 and the radio access unit 175 comprising only radio related components of the base station, the main unit 150 being located remotely from the radio access unit 175. Thus, if it is not inherently, it would have been obvious to ordinary skill in the art to replace the station 4a or the other end user that connected to the edge photonic switch 14a with the well known radio base station taught by specification, prior art figure 1, pages 2 and 3, paragraph 0004. One of ordinary skill in the art would have been motivated to do that in order to distribute the information signal to different end user. Thus, it improves the signal distribution of the optical system.

Regarding claim 16, Graves discloses in figure 13, the first and second edge photonic switch 14 including Ethernet switches 404 (page 22, paragraph 0191, line 8, paragraph 0194, line 2) that each include a wavelength multiplexer 62, 67.

Regarding claim 17, Graves discloses the wavelength multiplexer performs optical coarse wavelength division multiplexing (page 22, paragraph 0191, lines 10-12, paragraph 0194, lines 6-7).

Regarding claim 18, Graves discloses the fiber optic 17b is connected between the first and second edge photonic switch 14.

Regarding claims 1, 7, 14, 15, 19, 25 and 27, Graves discloses a system for integrating a fiber optic fixed access network and a fiber optic radio access network, comprising:

- at least one radio unit 10 (page 8, paragraph 0095, lines 5-6) for transmitting and receiving communications with at least one mobile unit 8 (page 8, paragraph 0095, line 4);

- a second edge photonic switch 14b (same as a first wavelength multiplexer) for transmitting and receiving the communications with the at least one radio unit 10 and fixed access communications 13c, 13d (page 8, paragraph 0095, line 2, paragraph 0096, line 2) with at least one fixed access subscriber 4c (page 8, paragraph 0096, line 4) wherein the first multiplexer is connected to each of the at least one radio unit 10 and to each of the at least one fixed access subscriber using fiber optic connections 13c, 13d (page 8, paragraph 0095, line 2, paragraph 0096, line 2), and wherein the S-DWDM carrier wavelengths are pre-assigned to each access multiplexer

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(12a, 12b, 12c, 12d) (page 8, paragraph 0099, lines 4-5), a wavelength converter 408 of figure 13; and

wherein a second edge photonic switch 14b (same as a first wavelength multiplexer) for multiplexing the radio communications on fiber 13c and the fixed access communications on fiber 13d are multiplexed onto a fiber communication link 17a; and

a first edge photonic switch 14a (same as claimed a second wavelength multiplexer), wherein the communications and the fixed access communications are transmitted and received together between the second edge photonic switch 14b (same as claimed first wavelength multiplexer) and the first edge photonic switch 14a (same as claimed a second wavelength multiplexer) through the fiber optic fixed access network 17a. Grave further discloses the first edge photonic switch 14a (same as claimed a second wavelength multiplexer) connected to station 4a or the other end user stations. Graves further discloses at least one main unit (e.g. core node 16), connected to the first edge photonic switch 14a (same as claimed a second multiplexer), for transmitting and receiving the communications with the first edge photonic switch 14a.

Grave differs from claim 1, 7, 14, 15, 19, 25 and 27 of the present invention in that Grave does not specifically disclose the first and second edge photonic switch 14a, 14b are the passive wavelength multiplexer. However, the specification page 15 discloses that the multiplexers can be passive multiplexer or passive multiplexer and the



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radio unit using the wavelength that is different from that used to communication with a fixed access subscriber.

Deng discloses a passive wavelength router (e.g., passive multiplexer/demultiplexer) employing fiber mux/demux construction for mux/demux CWDM signal (page 2, paragraph 0015).

At the time of the invention was made, it would have been obvious to a person of ordinary skill in the art to replace the edge photonic switches of Grave with the passive wavelength router taught by Deng. One of ordinary skill in the art would have been motivated to do this in order to reduce cost, and avoid transmission penalties (e.g., crosstalk), see page 2, paragraph 0016 of Deng.

Furthermore, the specification page 15 discloses that the multiplexers can be passive multiplexer or passive multiplexer and specification, prior art figure 1, pages 2 and 3, paragraph 0004 discloses a radio base station is divided into a main unit 150 and a digital intermediate frequency processing unit 110 and the radio access unit 175 comprising only radio related components of the base station, the main unit 150 being located remotely from the radio access unit 175. Thus, if it is not inherently, it would have been obvious to ordinary skill in the art to replace the station 4a or the other end user that connected to the edge photonic switch 14a with the well known radio base station taught by specification, prior art figure 1, pages 2 and 3, paragraph 0004. One of ordinary skill in the art would have been motivated to do that in order to distribute the information signal to different end user. Thus, it improves the signal distribution of the optical system.

Furthermore, even though Graves does not specifically disclose radio unit using the wavelength that is different from that used to communication with a fixed access subscriber. However, Graves discloses DWDM carrier wavelengths are pre-assigned to each access multiplexer (12a, 12b, 12c, 12d) (page 8, paragraph 0099, lines 4-5) (e.g. per each of radio unit and fixed access subscriber), therefore, it would have been obvious that each of radio unit and fixed access subscriber can be assigned different wavelength. It is notoriously known in the art that in a DWDM system, different wavelength can be assigned per each user or group of users.

Regarding claims 4, 22 and 28, Graves discloses in figure 13, the first and second edge photonic switch 14 including Ethernet switches 404 (page 22, paragraph 0191, line 8, paragraph 0194, line 2) that each include a wavelength multiplexer 62, 67.

Regarding claims 5, 23 and 29, Graves discloses the wavelength multiplexer performs optical coarse wavelength division multiplexing (page 22, paragraph 0191, lines 10-12, paragraph 0194, lines 6-7).

Regarding claims 6, 24 and 30, Graves discloses the fiber optic 17b is connected between the first and second edge photonic switch 14b.

Regarding claim 8, Graves discloses at least one main unit (e.g., edge photonic switch 14c) connected to the second multiplexer (e.g., edge photonic switch 14b) for transmitting and receiving the radio unit communications on fiber 13c and with a radio network 4a, 4b.

Regarding claim 10, Graves discloses the first and second multiplexer (e.g., edge photonic switch 14) includes Ethernet switch 404a (see figure 12)

Regarding claim 11, Deng discloses a passive wavelength router employing fiber mux/demux construction for mux/demux CWDM signal (page 2, paragraph 0015).

Regarding claim 12, Graves discloses fibers 13c, 13d, 17a, 17b, 13a, 13b connected between the fixed access unit the radio access unit and the multiplexers.

4. Claims 3, 9 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graves et al. US publication no. 2002/0191250 in view of Deng et al. US publication no. 2002/0196491 and further in view of Nishihara U.S. patent no. 6,512,616.

Regarding claims 3, 9 and 21, the combination of Graves and Deng disclose all the limitations except for the system further comprising: means for distributing a reference clock signal through the fiber optic fixed access network at a wavelength that is different from that used to transmit and receive the communications with each of the at least one radio unit and different from that used to transmit and receive the fixed access communications with the at least one fixed access subscriber. Nishihara discloses an optical system having a clock master unit 134 (col. 11, line 47) for generating and distributing a clock signal wavelength ( $\lambda_2$ ) 108 through out the optical system. It would have been obvious to an artisan at the time of the invention was made to include the teaching of Nishihara in the transmission system of Graves and Deng. One of ordinary skill in the art would have been motivated to do this since clock signal is well known in the art for synchronize the optical signal between the networks (specially in the SONET system) and for achieving accurate retiming, thus, it improves reliability of the optical system.

***Response to Arguments***

5. Applicant's arguments filed on 03/23/2006 have been fully considered but they are not persuasive.

**A Rejection of claims 1, 4-7, 10-19 and 22-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graves et al. US publication no. 2002/0191250 in view of Deng et al. US publication no. 2002/0196491.**

Regarding claim 13, Applicant disagrees with the rejection of Office Action dated 11/09/2005 that use the passive wavelength multiplexer of Deng in replacing with the photonic switches 14a, 14b of Graves. However as indicated in claim 13, Deng discloses a passive wavelength router (e.g., passive multiplexer/demultiplexer) employing fiber mux/demux construction for mux/demux CWDM signal (page 2, paragraph 0015). At the time of the invention was made, it would have been obvious to a person of ordinary skill in the art to replace the edge photonic switches of Graves with the passive wavelength router taught by Deng.

One of ordinary skill in the art would have been motivated to do this in order to reduce cost, and avoid transmission penalties (e.g., crosstalk), see page 2, paragraph 0016 of Deng. Furthermore, the specification page 15 discloses that the multiplxers can be passive multiplexer or passive multiplexer.

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Applicant further argues that examiner block 12c of Fig. 3 to be a radio access unit. Examiner respectfully disagree, in the rejection of Office Action dated 11/09/2005, Examiner cited element 10 of Fig. 3 as a radio access unit.

Applicant further argues that examiner describes Graves' second edge photonic switch 14a as comprising several nodes. Examiner respectfully disagree, no where in the rejection of Office Action dated 11/09/2005, cited that Graves' second edge photonic switch 14a comprising several nodes. Examiner reject claim 13 to map Graves' second edge photonic switch 14a as a first multiplexer 220 of the specification Figure 2.

The new rejection of claims 1, 7, 13, 19 and 25 also address the argument base on the new added limitations.

### ***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung Tran whose telephone number is (571) 272-3025.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Jason Chan, can be reached on (571) 272-3022.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

  
Dzung Tran

05/26/2006